

Notice of Allowability

Application No.

10/062,099

Applicant(s)

PACHON ET AL.

Examiner

Romain Jeanty

Art Unit

3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to January 18, 2008.
2. ☒ The allowed claim(s) is/are 1-5, 7-13, 15-16, 18-23.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


ROMAIN JEANTY
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Robert Hirning on January 18, 2008.

Listing of Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Previously Presented) A system for rapidly generating multiple alternative pilot training and transition plans which include a recall of furloughed pilots for an entire airline, which comprises:

- a user interface receiving input data and user requests including a request to recall said furloughed pilots;

- a database having stored therein said input data and a current pilot training and transition plan; and

- an optimizer system in electrical communication with said user interface and said database for receiving said user requests, said input data, and said current pilot training and transition plan for generating MIP (mixed integer programming) Model which includes said recall of said furloughed pilot, wherein MIP is mixed integer problem, and rapidly solving said MIP Model to provide said multiple alternative pilot training and transition plans;

- wherein said MIP Model includes following objective function:

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$$\begin{aligned}
& \text{Minimize } PNH \sum_t \sum_h NHCost_{ht} y_{NHht} + PNA \sum_t \sum_{i \in NA} NACost_{it} y_{it} + \\
& PF \sum_t \sum_{i \in F} FCost_{it} y_{it} + Ppay \left(\sum_{i \in \lambda_1} a_i R_i + \sum_{i \in 58Y} a_i R_{58i} + \sum_{i \in \lambda_2} a_i M_i \right) + \\
& PS * PBH \sum_h \sum_i S_{ht} / Blockhrs_{ht} + PE * PBH * (1/3) \sum_h \sum_i E_{ht} / Blockhrs_{ht} + \\
& PF \sum_t \sum_{i \in \lambda_{FR}} FRCost_{it} y_{FRit}
\end{aligned}$$

wherein PNH is Level of importance of New Hire Cost in the solution;

NH $Cost_{ht}$ is Cost per new hire advanced to position h in period t (computed as the number of month between t and the end of the planning horizon, times the pay rate, times the average pay hours);

PNA is Level of importance of no-awards cost in the solution;

NA $Cost_{it}$ is Cost if pilot i \in NA is released in bid period t (computed as the number of months between t and the beginning of the planning horizon, times the pay rate, times the average pay hours);

F $Cost_{it}$ is Cost if pilot i \in F is furloughed in bid period t (computed as the number of months between t and the beginning of the planning horizon, times the pay rate, times the average pay hours);

Ppay is Level of importance of pay protection cost in the solution;

PS is Level of importance of shortages in block hours in the solution;

PE is Level of importance of excess in block hours in the solution;

PF is Level of importance of furloughs cost in the solution;

PBH is Cost associated to each block hour missed due lack of crews; and

Block $_{ht}$ is Business plan block hours for position h in bid period t.

2. (Original) The system of Claim 1, wherein said multiple alternative pilot training and transition plans are generated in less than one hour, and are cost optimized.

3. (Original) The system of Claim 1, wherein said recall of said furloughed pilots

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occurs in order of seniority and before any new pilots are hired.

4. (Original) The system of Claim 1, wherein said user requests include a user option to limit percentage of pilots whose start bid periods for training assignments occur outside of a bid period of said current pilot training and transition plan.

5. (Original) The system of Claim 1, wherein said user requests include a user option to limit total percentage of pilots whose start bid periods for training assignments occur within a bid period of said current pilot training and transition plan, and of said pilots whose start bid periods for training assignments occur outside of said bid period.

6. (Canceled)

7. (Previously Presented) The system of Claim 1, wherein said MIP Model includes following constraint to ensure that said furloughed pilots are recalled in seniority order:

$$\sum_{t=k}^N y_{FRit} - \sum_{t=k}^N y_{FRi-t} \leq 0 \quad \forall i \in \lambda_{FR}, k \in \{1..N\}$$

8. (Previously Presented) The system of Claim 1, wherein said MIP Model includes following constraint to ensure that new pilots are hired after all of said furloughed pilots are recalled:

$$y_{NHht} - MNH_{ht} \sum_{t=1}^k y_{FRit} \leq 0 \quad \forall h, k \in \{1..N\}$$

9. (Previously Presented) The system of Claim 1, wherein said MIP Model includes following constraints to limit percentage of pilots whose start bid periods for training assignments may deviate from a bid period of said current pilot training and transition plan:

$$(i) \quad \sum_i t y_{it-L(i)} - W_i - d_i + q_i = 0 \quad \forall i \in \lambda;$$

$$(ii) \quad d_i + q_i \leq \text{BigM} * h_i \quad \forall i \in \lambda; \text{ and}$$

$$(iii) \quad \left(\sum_{i \in \text{Adv}_t} h_i / U_t \right) \leq P_U_t \quad \forall t \in \{1..N\}.$$

10. (Previously Presented) The system of Claim 1, wherein said MIP Model includes following constraints to limit total percentage of pilots whose start bid period for training assignments may be changed to occur within a bid period of said current pilot training and transition plan, and of said pilots whose start bid period for training assignments may be changed to occur outside of said bid period:

$$(i) \quad \text{diff}_{it} = 1 - y_{it} \quad \forall i \in \lambda, t \in \{1..N\} \mid CM_{it} = 1;$$

$$(ii) \quad \text{diff}_{it} = y_{it} \quad \forall i \in \lambda, t \in \{1..N\} \mid CM_{it} = 0; \text{ and}$$

$$(iii) \quad \sum_{i \in \lambda} \text{diff}_{it} / U_t \leq P_U_t \quad \forall t \in \{1..N\}.$$

11. (Currently amended) A system for rapidly generating multiple alternative pilot training and transition plans which include a limit to changing start bid periods for training assignments for an entire airline, which comprises:

a user interface receiving input data and user requests including a request to limit changes to said start bid periods;

a database having stored therein said input data and a current pilot training and transition plan; and

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an optimizer system in electrical communication with said user interface and said database for receiving said user requests, said input data, and said current pilot training and transition plan, for generating an MIP (mixed integer programming) Model which includes said limit, wherein MIP is mixed integer problem and rapidly solving said MIP Model to provide said multiple alternative pilot training and transition plans;

wherein said MIP Model includes a following objective component for tracking payroll cost of pilots recalled from furlough:

$$PF \sum_t \sum_{i \in \lambda_{FR}} FRCost_{it} y_{FRit}$$

wherein PF is Level of importance of furloughs cost in the solution;

wherein $FRCost_{it}$ is Cost if pilot $i \in FR$ is advanced in bid period t (computed as the number of bid periods between t and the end of the planning horizon, times the pay rate, times the average pay hours); and

wherein y_{FRit} is a binary variable indicating whether pilot $i \in FR$ is recalled in bid period t , taking a value 1 if the pilot is recalled and 0 otherwise.

12. (Original) The system of Claim 11, wherein said limit applies to a percentage of pilots whose start bid periods for training assignments may deviate from a bid period of said current pilot training and transition plan .

13. (Original) The system of Claim 11, wherein said limit applies to total percentage of pilots whose start bid period for training assignments may be changed to occur within a bid period of said current pilot training and transition plan, and of said pilots whose start bid period for training assignments may be changed to occur outside of said bid period.

14. (Canceled)

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15. (Original) The system of Claim 11, wherein said multiple alternative pilot training and transition plans are cost optimized, and a following objective component for tracking payroll costs of pilots recalled from furlough is included in the MIP model:

$$PF \sum_i \sum_{i \in \lambda_{FR}} FRCost_{it} y_{FRit}$$

16. (Currently amended) A system for generating multiple alternative pilot training and transition plans which include a recall of furloughed pilots for an entire airline, which comprises:

a user interface receiving input data and user requests including a request to recall said furloughed pilots ;

a database having stored therein said input data; and

an optimizer system in electrical communication with said user interface and said database for receiving said user requests and said input data, and generating therefrom an MIP (mixed integer programming) Model including said recall of said furloughed pilots, wherein MIP is mixed integer problem, and for solving said MIP Model to rapidly generate said multiple alternative pilot training and transition plans;

wherein said multiple alternative pilot training and transition plans are cost optimized and generated in less than one hour, and said MIP Model includes a following objective component for tracking payroll costs of pilots recalled from furlough:

$$PF \sum_i \sum_{i \in \lambda_{FR}} FRCost_{it} y_{FRit}$$

wherein PF is Level of importance of furloughs cost in the solution;

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wherein $FRCost_{it}$ is Cost if pilot $i \in FR$ is advanced in bid period t (computed as the number of bid periods between t and the end of the planning horizon, times the pay rate, times the average pay hours); and

wherein y_{FRit} is a binary variable indicating whether pilot $i \in FR$ is recalled in bid period t , taking a value 1 if the pilot is recalled and 0 otherwise.

17. (Canceled)

18. (Original) The system of Claim 16, wherein said MIP Model includes following constraints to limit percentage of pilots whose start bid periods for training assignments may differ from a specific bid period:

$$(i) \quad \sum_i t y_{it-L(i)} - W_i - d_i + q_i = 0 \quad \forall i \in \lambda;$$

$$(ii) \quad d_i + q_i \leq BigM * h_i \quad \forall i \in \lambda; \text{ and}$$

$$(iii) \quad \left(\sum_{i \in Adv_t} h_i / U_i \right) \leq P_U_t \quad \forall t \in \{1..N\}.$$

19. (Original) The system of Claim 16, wherein said MIP Model includes following constraints to limit total percentage of pilots whose start bid period for training assignments may be changed to occur within a specific bid period, and of said pilots whose start bid period for training assignments may be changed to occur outside of said bid period:

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$$(i) \quad diff_{it} = 1 - y_{it} \quad \forall i \in \lambda, t \in \{1..N\} \mid CM_{it} = 1;$$

$$(ii) \quad diff_{it} = y_{it} \quad \forall i \in \lambda, t \in \{1..N\} \mid CM_{it} = 0; \text{ and}$$

$$(iii) \quad \sum_{i \in \lambda} diff_{it} / U_t \leq P_U_t \quad \forall t \in \{1..N\}.$$

20. (Currently amended) An optimizer system including a database for rapid generation of multiple alternative pilot training and transition plans that accommodate a recall of furloughed pilots, which comprises:

data means for receiving user requests and input data from a user;

operating means in electrical communication with said data means for generating variables and constraints from said user requests and said input data, for generating an MIP (mixed integer programming) Model from said variables and said constraints which provides for said recall of said furloughed pilots in seniority order and before hiring of new pilots, wherein MIP is mixed integer problem; and

means for solving said MIP Model with said variables and said constraints to generate therefrom said multiple alternative pilot training and transition plans with cost factor optimization;

wherein said MIP Model includes a following objective function:

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$$\begin{aligned}
& \text{Minimize } PNH \sum_t \sum_h NHCost_{ht} y_{NHht} + PNA \sum_t \sum_{i \in NA} NACost_{it} y_{it} + \\
& PF \sum_t \sum_{i \in F} FCost_{it} y_{it} + Ppay \left(\sum_{i \in \lambda_1} a_i R_i + \sum_{i \in 58Y} a_i R_{58i} + \sum_{i \in \lambda_2} a_i M_i \right) + \\
& PS * PBH \sum_h \sum_i S_{hi} / Blockhrs_{hi} + PE * PBH * (1/3) \sum_h \sum_i E_{hi} / Blockhrs_{hi} + \\
& PF \sum_t \sum_{i \in \lambda_{FR}} FRCost_{it} y_{FRit}
\end{aligned}$$

wherein PNH is Level of importance of New Hire Cost in the solution;

NHCost_{ht} is Cost per new hire advanced to position h in period t (computed as the number of month between t and the end of the planning horizon, times the pay rate, times the average pay hours);

PNA is Level of importance of no-awards cost in the solution;

NACost_{it} is Cost if pilot i e NA is released in bid period t (computed as the number of months between t and the beginning of the planning horizon, times the pay rate, times the average pay hours);

FCost_{it} is Cost if pilot i e F is furloughed in bid period t (computed as the number of months between t and the beginning of the planning horizon, times the pay rate, times the average pay hours);

Ppay is Level of importance of pay protection cost in the solution;

PS is Level of importance of shortages in block hours in the solution;

PE is Level of importance of excess in block hours in the solution;

PF is Level of importance of furloughs cost in the solution;

PBH is Cost associated to each block hour missed due lack of crews; and

Block_{ht} is Business plan block hours for position h in bid period t.

21. (Currently amended) An optimizer system including a database for rapid generation of multiple alternative pilot training and transition plans that include a recall of furloughed pilots, which comprises:

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data means for receiving user requests including a request to "recall said furloughed pilots, and for receiving input data, and a current pilot training and transition plan;

operating means in electrical communication with said data means for receiving said user requests, said input data, and said current pilot training and transition plan, for generating variables and constraints therefrom, and for generating an MIP (mixed integer programming) Model from said variables and said constraints to provide said recall of said furloughed pilots in seniority order and before hiring of new pilots, and provide a limit to deviating start bid periods for training assignments with respect to a bid period of said current pilot training and transition plan; and

means for solving said MIP Model with said variables and said constraints to generate said multiple alternative pilot training and transition plans with cost optimization,

wherein said MIP Model includes a following objective function:

$$\begin{aligned}
 & \text{Minimize } PNH \sum_t \sum_h NHCost_{ht} y_{NHht} + PNA \sum_t \sum_{i \in NA} NACost_{it} y_{it} + \\
 & PF \sum_t \sum_{i \in F} FCost_{it} y_{it} + Ppay \left(\sum_{i \in \lambda_1} a_i R_i + \sum_{i \in 58Y} a_i R_{58i} + \sum_{i \in \lambda_2} a_i M_i \right) + \\
 & PS * PBH \sum_h \sum_t S_{ht} / Blockhrs_{ht} + PE * PBH * (1/3) \sum_h \sum_t E_{ht} / Blockhrs_{ht} + \\
 & PF \sum_t \sum_{i \in \lambda_{FR}} FRCost_{it} y_{FRit}
 \end{aligned}$$

wherein PNH is Level of importance of New Hire Cost in the solution;

NHCost_{ht} is Cost per new hire advanced to position h in period t (computed as the number of month between t and the end of the planning horizon, times the pay rate, times the average pay hours);

PNA is Level of importance of no-awards cost in the solution;

NACost_{it} is Cost if pilot i e NA is released in bid period t (computed as the number of months between t and the beginning of the planning horizon, times the pay rate, times the average pay hours);

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FCost_{it} is Cost if pilot $i \in F$ is furloughed in bid period t (computed as the number of months between t and the beginning of the planning horizon, times the pay rate, times the average pay hours);

Ppay is Level of importance of pay protection cost in the solution;

PS is Level of importance of shortages in block hours in the solution;

PE is Level of importance of excess in block hours in the solution;

PF is Level of importance of furloughs cost in the solution;

PBH is Cost associated to each block hour missed due lack of crews; and

Block_{ht} is Business plan block hours for position h in bid period t .

22. (Original) The optimizer system of Claim 21, wherein said limit is applied to a percentage of pilots whose start bid periods for training assignments occur outside of said bid period.

23. (Original) The optimizer system of Claim 21, wherein said limit is applied to a total percentage of said furloughed pilots whose start date for training assignments is changed to occur within said bid period, and of said furloughed pilots whose start date for training assignments is changed to occur outside of said bid period.

24. (Canceled)

25. (Canceled)

26. (Canceled)

27. (Canceled)

28. (Canceled)

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29. (Canceled)

30. (Canceled)

31. (Canceled)

Allowable Subject Matter

2. Claims 1-5, 7-13, 15-16, and 18-23 are allowed.

Reasons for Allowance

3. The following is an Examiner's statement of reasons for allowance:

The closest prior art is Sato et al (U.S. Patent No. 6,651,0460). Sato et al discloses an optimizing method for optimization, the total number of crew required for flight services and a crew pairing model calculation unit for calculating a fitness of a solution. However Sato et al fail to teach an optimizer system in electrical communication with said user interface and said database for receiving said user requests, said input data, and said current pilot training and transition plan for generating MIP (mixed integer programming) Model which includes said recall of said furloughed pilot, wherein MIP is mixed integer problem, and rapidly solving said MIP Model to provide said multiple alternative pilot training and transition plans, wherein said MIP Model includes following objective function of claim 1 above.

The closest prior art is Sato et al (U.S. Patent No. 6,651,0460). Sato et al discloses an optimizing method for optimization, the total number of crew required for flight services and a crew pairing model calculation unit for calculating a fitness of a solution. However Sato et al fail to teach an optimizer system in electrical communication with said user interface and said database for receiving said user requests, said input data, and said current pilot training and

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transition plan, for generating an MIP (mixed integer programming) Model which includes said limit, wherein MIP is mixed integer problem and rapidly solving said MIP Model to provide said multiple alternative pilot training and transition plans, wherein said MIP Model includes a following objective component for tracking payroll cost of pilots recalled from furlough, using the formula in claim 11 above.

The closest prior art is Sato et al (U.S. Patent No. 6,651,0460). Sato et al discloses an optimizing method for optimization, the total number of crew required for flight services and a crew pairing model calculation unit for calculating a fitness of a solution. However Sato et al fail to teach an optimizer system in electrical communication with said user interface and said database for receiving said user requests and said input data, and generating therefrom an MIP (mixed integer programming) Model including said recall of said furloughed pilots, wherein MIP is mixed integer problem, and for solving said MIP Model to rapidly generate said multiple alternative pilot training and transition plans, wherein said multiple alternative pilot training and transition plans are cost optimized and generated in less than one hour, and said MIP Model includes a following objective component for tracking payroll costs of pilots recalled from furlough using the formula in claim 16 above

The closest prior art is Sato et al (U.S. Patent No. 6,651,0460). Sato et al discloses an optimizing method for optimization, the total number of crew required for flight services and a crew pairing model calculation unit for calculating a fitness of a solution. However Sato et al fail to teach operating means in electrical communication with said data means for generating variables and constraints from said user requests and said input data, for generating an MIP (mixed integer programming) Model from said variables and said constraints which provides for said recall of said furloughed pilots in seniority order and before hiring of new pilots, wherein MIP is mixed integer problem, and means for solving said MIP Model with said variables and said constraints to generate therefrom said multiple alternative pilot training and transition plans with cost factor optimization, wherein said MIP Model includes a following objective function of claim 20 above.

The closest prior art is Sato et al (U.S. Patent No. 6,651,0460). Sato et al discloses an

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optimizing method for optimization, the total number of crew required for flight services and a crew pairing model calculation unit for calculating a fitness of a solution. However Sato et al fail to teach an operating means in electrical communication with said data means for receiving said user requests, said input data, and said current pilot training and transition plan, for generating variables and constraints therefrom, and for generating an MIP (mixed integer programming) Model from said variables and said constraints to provide said recall of said furloughed pilots in seniority order and before hiring of new pilots, and provide a limit to deviating start bid periods for training assignments with respect to a bid period of said current pilot training and transition plan, means for solving said MIP Model with said variables and said constraints to generate said multiple alternative pilot training and transition plans with cost optimization, wherein said MIP Model includes a following objective function of claim 21 above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

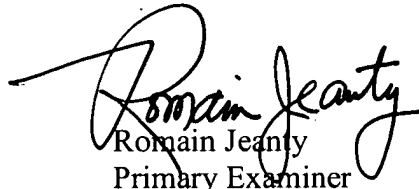
4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Romain Jeanty whose telephone number is (571) 272-6732. The examiner can normally be reached on Mon-Thurs 7:30 a.m. to 6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq R. Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

March 5, 2007


Romain Jeanty
Primary Examiner
Art Unit 3623
January 22, 2008